

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Cancel claims 1-4

[1. An ultrasonic clamp coagulator apparatus comprising:
a housing, said housing comprising an actuator;
an outer tube having a proximal end joined to said housing, and
a distal end, said outer tube defining a longitudinal axis;
an actuating element reciprocally positioned within said outer tube, said actuating element operatively connected to said actuator;
an ultrasonic waveguide positioned within said outer tube, said ultrasonic waveguide having an end-effector extending distally from said distal end of said outer tube,
wherein said end-effector comprises a broad edge and a narrow edge,
wherein said narrow edge is defined by the intersection of a first surface and a second surface, wherein said first surface extends proximally into said end-effector defining a length of said first surface;
and
a clamp arm pivotally mounted on said distal end of said outer tube for pivotal movement with respect to said end-effector for clamping tissue between said clamp arm and said end-effector, said pivotal movement occurring about a horizontal axis, the arc of said pivotal movement of said clamp arm defining a vertical plane, said vertical plane having a vertical axis orthogonal to both said longitudinal axis and said horizontal axis, said clamp arm operatively connected to said actuating element so that reciprocal movement of said actuating element pivots said clamp arm along said vertical plane;
wherein said length of said first surface balances said waveguide such that excursion of said waveguide is minimized in said vertical plane.

2. An ultrasonic clamp coagulator apparatus according to claim 1, wherein excursion of said end-effector along said vertical axis is limited to less than 15 %.

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3. An ultrasonic clamp coagulator apparatus according to claim 1, wherein excursion of said end-effector along said vertical axis is limited to less than 10 %.

4. An ultrasonic clamp coagulator apparatus according to claim 1, wherein excursion of said end-effector along said vertical axis is limited to less than 5 %.]

Add new claims 19-26:

--19. An end effector for use in an ultrasonic surgical instrument, wherein said end effector comprises;

an ultrasonic transmission rod having a proximal end and a distal end;

an ultrasonically actuated blade attached to said distal end of the transmission rod, wherein the blade comprises:

a distal end;

a proximal end connected to the transmission rod at a longitudinal vibratory node point;

a treatment portion including at least one functional asymmetry and a balance asymmetry, wherein the balance asymmetry is positioned to counter torque created at the proximal end of the blade by the functional asymmetry.

20. The end effector of claim 19, wherein the balance asymmetry is positioned such that transverse vibrations in at least one axis at the distal end of the blade are substantially equal to zero.

21. An ultrasonic waveguide having a proximal end and a distal end for use in an ultrasonic surgical instrument, wherein the waveguide comprises:

a balanced ultrasonically actuated blade positioned at the distal end of the waveguide, wherein the blade comprises:

a distal end;

a proximal end;

a curved treatment portion, and the curved treatment portion comprising

a balance portion including at least one balance asymmetry, wherein the

balance asymmetry is positioned to counter torque created by the curved treatment portion.

22. The waveguide of claim 21, wherein the balance portion extends from the distal end of the blade to a point within the treatment portion.

23. The waveguide of claim 21, wherein the balance portion extends from the distal end of the blade to a point proximal to the treatment portion.

24. An ultrasonic surgical instrument including a balanced blade, the surgical instrument comprises:

- a handle including a ultrasonic handpiece;

- an ultrasonic waveguide having a proximal end and a distal end, wherein the proximal end is operatively connected to the handpiece;

- the balanced blade connected to the distal end of the waveguide, wherein the balanced blade comprises:

- a distal end;

- a proximal end connected to the waveguide at a longitudinal vibratory node point;

- a treatment portion including at least one functional asymmetry and a balance region including at least one balance asymmetry, wherein the balance asymmetry is positioned to counter torque created by the functional asymmetry.

25. The surgical instrument of claim 24, wherein the balance asymmetry is positioned such that transverse vibrations are substantially equal to zero.

26. An ultrasonic waveguide having a proximal end and a distal end for use in an ultrasonic surgical instrument, wherein the waveguide comprises:

- a balanced ultrasonically actuated blade positioned at the distal end of the waveguide, wherein the blade comprises:

- a distal end;

- a proximal end;

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a treatment portion defined in part by two radiused cuts offset by a distance to form a curved geometry, and the treatment portion further comprising at least one balance asymmetry, wherein the balance asymmetry is positioned to counter torque created by the curved treatment portion.--